

CLAIMS

1. A method for determining a birth date of a biomolecule comprising the steps of:
 - (a) providing a biomolecule;
 - (b) determining a delta ^{14}C value of the biomolecule; and
 - (c) determining a birth date of said biomolecule by comparing the delta ^{14}C value of said DNA with a calibration delta ^{14}C chart to determine an birth date of said biomolecule.
2. The method of claim 1 wherein said biomolecule is whole cell tissue.
3. The method of claim 1 wherein said biomolecule is isolated from a tissue.
4. The method of claim 1 wherein said biomolecule is an animal, a plant, a virus or a part thereof.
5. The method of claim 1 wherein said biomolecule is isolated from a purified cell population.
6. The method of claim 5 wherein said purified cell population is a neuronal cell population.
7. The method of claim 1 wherein said biomolecule is a DNA molecule.
8. The method of claim 7 wherein said DNA molecule is isolated from a tissue, a cell line, or a purified cell population.
9. The method of claim 8 wherein said purified cell population is purified according to a secondary birth date sorting method.
10. The method of claim 9 wherein said secondary birth date sorting method is performed by fluorescence-activated cell sorter to separate different types of cells.

FACS sorting of cells based on histone acetylation level, DNA oxidation level, cellular lipofuscin level, or a combination thereof.

11. The method of claim 1 wherein said delta ^{14}C value is determined by an accelerator mass spectrometer.
12. The method of claim 1 wherein said calibration delta ^{14}C chart is selected from a calibration delta ^{14}C chart shown in Figure 1.
13. The method of claim 12 wherein said delta ^{14}C chart is selected from the group consisting of a chart shown in Figure 1A, Figure 1B, Figure 1C, Figure 1D and Figure 1E.
14. The method of claim 1, wherein said biomolecule is derived from a cell; and wherein said cell is analyzed by a secondary birth dating method before step (b).
15. The method of claim 14 wherein said secondary birth dating method comprises measuring histone acetylation level, DNA oxidation level, cellular lipofuscin level or a combination thereof.
16. The method of claim 14 wherein said secondary birth dating method comprise using a fluorescence activated cell sorter to measure said histone acetylation levels, DNA oxidation levels, cellular lipofuscin levels.
17. A method of determine the birth date of a biomolecule in a organism population comprising the steps of:
 - (a) collecting a sample of said biomolecule from an organism population; wherein said biomolecule is purified away from other carbon containing molecules of said organism population;
 - (b) determining a delta ^{14}C value of the carbon atoms in said biomolecule; and

- (c) comparing the delta ^{14}C value with a calibration delta ^{14}C chart to determine a birth date of said biomolecule by
- 18. The method of claim 17 wherein said organism is an animal, a plant or a virus.
 - 19. The method of claim 17 wherein said biomolecule is DNA.
 - 20. The method of claim 17 wherein said biomolecule is tooth enamel from an animal.
 - 21. The method of claim 20, wherein said animal is selected from the group consisting of a human, a horse, a pig, a cow, a rabbit, a dog, a rat and a mouse.
 - 22. The method of claim 17, wherein said delta ^{14}C value is determined by an accelerator mass spectrometer (AMS).
 - 23. The method of claim 17 further comprising a step of calculating a birth date of said animal from the birth date of said biomolecule.
 - 24. The method of claim 17 further comprising a step of measuring a second indicator of cell age.
 - 25. The method of claim 24 wherein said second indicator is selected from the group consisting of histone acetylation levels, DNA oxidation levels, cellular lipofuscin levels or a combination thereof.
 - 26. A method for determining an effect of a candidate agent on the cell proliferation of a tissue type in an animal comprising the steps of:
 - (a) determining a first birth date of a first cell sample from said tissue type from said animal using the method of claim 1;
 - (b) administering said candidate compound to said animal;

- (c) determining a second birth date of a second cell sample from said tissue type animal using the method of claim 1; and
 - (d) comparing said first and second birth dates to determine if the candidate agent has an effect on cell proliferation.
- 27. The method of claim 26 wherein said tissue type is a CNS tissue type.
- 28. A method of determining the effect of a treatment on cell proliferation comprising the steps of:
 - (a) determining a first birth date of a first cell sample from an animal using the method of claim 1;
 - (b) inducing said event in said animal;
 - (c) determining a second birth date of a second cell sample from the same animal using the method of claim 1, wherein said first and second neuronal cell sample are from the same tissue; and
 - (d) comparing the first and second birth date to determine if the neurological event has an effect on cell proliferation.
- 29. The method of claim 28, wherein said treatment is selected from the group consisting of trauma, an induced disorder, a surgical procedure, and the administration of an agent.
- 30. The method of claim 28 wherein said treatment induces or affects a neurological disorder.
- 31. A method for determining a birth date of a biomolecule comprising the steps of:
 - (a) providing a biomolecule;
 - (b) determining an isotope concentration of said biomolecule;
 - (c) determining a birth date of said biomolecule by comparing the isotope concentration with a calibration isotope concentration chart to determine a birth date of said biomolecule.